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Langley Research Center

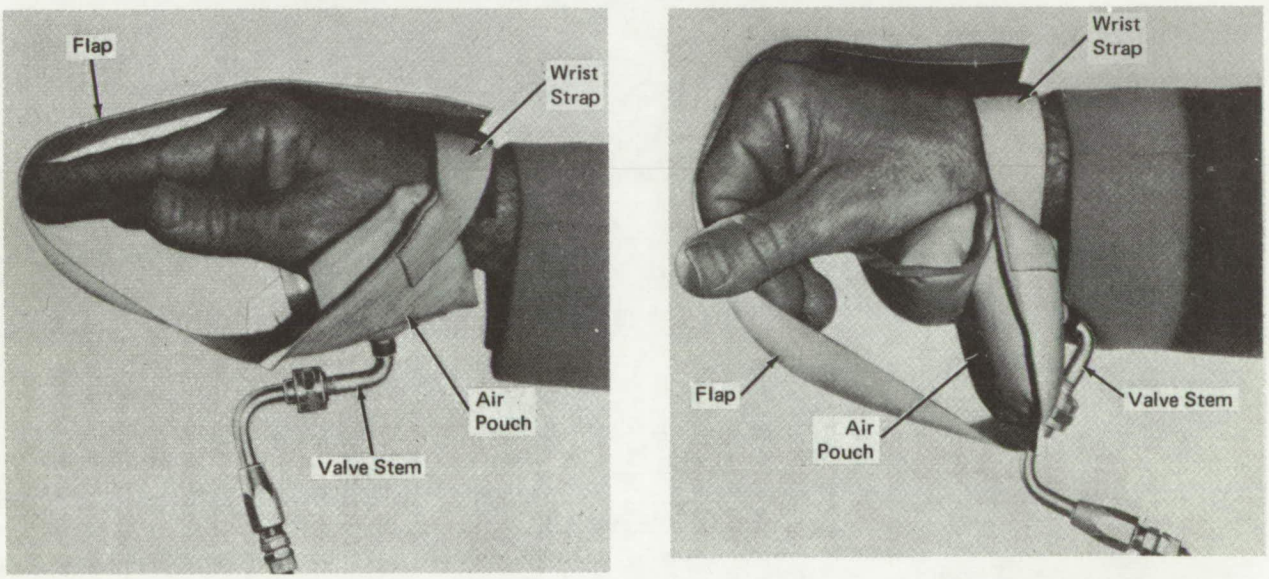
Therapeutic Hand-Exercising Device With Cycling Pressure Value

Individuals who are incapable of exercising their fingers by themselves, either because of injury or disease, can be assisted by a new device (see figure). This device is used to exercise the hands of persons whose fingers are generally straight and need to be flexed inward toward the palms of the hands.

The illustration shows the uninflated exercise glove-like device (a), which is formed from a thin material composed of a fabric-reinforced elastomer, attached to a hand with straight fingers. As the pouch is inflated (b), the flap, which is attached to the wrist straps, is pulled toward the wrist, thus forcing the fingers to bend. The degree and rate of bending is dependent upon the degree of pressurization and the rate of inflation. If full deflection of the fingers is desired, the degree of pressurization required will be approximately 1 psig (108×10^3 N/m^2).

Two ribs are bonded internally to the air pouch and serve to limit the amount of air required to pressurize the pouch. The wrist straps and the flap have nylon tape fasteners to provide easy attachment. The wrist straps are fastened together to secure the glove to the wrist, and the flap is passed around the fingers and also fastened at the wrist. Air enters and leaves the pouch through the valve stem.

The air required to inflate the glove can be obtained from such sources as a squeeze-type bulb, a foot-operated pump, or a compressor assembly designed to cycle air in and out at a rate selected by the patient. A rotary-type valve was designed for use with the compressor assembly. It provides a simple, inexpensive method for cycling the pressure of a contained gas. This valve has six ports and a shaft which controls the flow of gas or air into or out of the valve through the ports.



Therapeutic Hand-Exercising Device With Cycling Pressure Valve

(continued overleaf)

Two of the ports are connected to a pump, two are connected to the gas container, and two provide the cyclic pressurization to the therapeutic device.

The patient can instantly free himself from this device by simply pulling the flap free from the wrist straps. This capability minimizes the sense of claustrophobia characteristic of most patients. The device is extremely simple in design, which will reduce manufacturing costs, and will fit all hand sizes.

Note:

Requests for further information may be directed to:

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Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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